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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,539	10/24/2003	Emest C. Chen	PD-200250	9872

20991 7590 05/31/2007
THE DIRECTV GROUP INC
PATENT DOCKET ADMINISTRATION RE/R11/A109
P O BOX 956
EL SEGUNDO, CA 90245-0956

EXAMINER	
WILLIAMS, LAWRENCE B	
ART UNIT	**PAPER NUMBER**
2611	

MAIL DATE	DELIVERY MODE
05/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/692,539	CHEN, EMEST C.
	Examiner	Art Unit
	Lawrence B. Williams	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 28 Febryary 2007.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4,6,8-12,14,16-20,22 and 24 is/are rejected.

7)☒ Claim(s) 5,7,13,15,21 and 23 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 28 February 2007. These drawings are accepted by the examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4, 6, 9, 12, 14, 17, 20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2).

Chen et al. discloses in Fig(s). 1 and 3, a system for measuring phase noise, comprising: a tuner (Fig. 1, element 16) for tuning a signal from a device and converting the signal to a baseband signal; at least one analog-to-digital converter (Fig. 1, element 18) (ADC) for capturing data from the baseband signal; a timing processor (Fig. 3, element 128) for acquiring and tracking symbol timing of the captured data of the baseband signal (col. 6, lines 13-15).

Chen et al. does not teach a carrier processor for determining unwrapped phase history data from the tracked symbol timing; a line fitting processor for determining a linear phase by fitting a straight line to the unwrapped phase history data; and a subtractor for subtracting the linear phase from the phase history data to produce a residual phase of the carrier.

However, Yamaguchi et al. discloses in Fig. 6, a method of obtaining a phase noise waveform of a signal under measurement (col. 3, lines 54-56) wherein he teaches a processor (28) for determining unwrapped phase history, a line fitting processor (29) for determining a linear phase by fitting a straight line to the unwrapped phase history data; and a subtractor (29) for subtracting the linear phase from the phase history data to produce a residual phase of the signal (col. 2, lines 53 - col. 3, line 11).

Therefore it would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Yamaguchi et al. as a method of obtaining an instantaneous phase noise waveform for an accurate high speed jitter measurement (col. 3, lines 43-51).

(2) With regard to claim 4, Yamaguchi et al. also discloses the system of claim 1, wherein the line fitting processor performs a minimum mean square (MMS) operation on the phase history data to determine the linear phase (col. 3, lines 6-7).

One skilled in the art would readily recognize that a minimum mean square error (MMS) operation is a standard error calculation algorithm. It would have been obvious to one skilled in the art at the time of invention to incorporate the minimum mean square (MMS) operation as disclosed by Yamaguchi et al. to obtain an accurate linear phase measurement.

(3) With regard to claim 6, Chen et al. also discloses wherein the signal comprises a satellite television signal (col. 4, lines 1-10; terrestrial digital television broadcasting).

(4) With regard to claim 9, claim 9 merely discloses the method of the system disclosed in claims 1. Therefore a similar rejection applies.

(5) With regard to claim 12, Yamaguchi et al. also discloses the system of claim 9, wherein fitting the line comprises performing a minimum mean square (MMS) operation on the phase history data to determine the linear phase (col. 3, lines 6-7).

One skilled in the art would readily recognize that a minimum mean square error (MMS) operation is a standard error calculation algorithm. It would have been obvious to one skilled in the art at the time of invention to incorporate the minimum mean square (MMS) operation as disclosed by Yamaguchi et al. to obtain an accurate linear phase measurement.

(6) With regard to claim 14, Chen et al. also discloses the method, wherein the signal comprises a satellite television signal (col. 4, lines 1-10; terrestrial digital television broadcasting).

(7) With regard to claim 17, claim 17 discloses limitations substantially similar to the limitations of claim 1. Therefore a similar rejection applies.

(8) With regard to claim 20, Yamaguchi et al. also discloses the system of claim 17, wherein the means for fitting the line comprises means for performing a minimum mean square (MMS) operation on the phase history data to determine the linear phase (col. 3, lines 6-7).

One skilled in the art would readily recognize that a minimum mean square error (MMS) operation is a standard error calculation algorithm. It would have been obvious to one skilled in the art at the time of invention to incorporate the minimum mean square (MMS) operation as disclosed by Yamaguchi et al. to obtain an accurate linear phase measurement.

(9) With regard to claim 22, Chen et al. also discloses the system of claim 17, wherein the signal comprises a satellite television signal (col. 4, lines 1-10; terrestrial digital television broadcasting).

4. Claims 2, 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2) as applied to claim 1, and further in view of Scott et al. (Ultralow Phase noise Ti:Sapphire Laser Rivals 100 MHZ Crystal Oscillator.

(1) With regard to claim 2, as noted above, the combination of Chen et al. and Yamaguchi et al. disclose all limitations of claim 1. They do not however disclose the system of claim 1, further comprising a fast Fourier transform (FFT) processor for determining a phase noise spectrum from the residual phase from the subtractor, though Chen et al. does teach a spectrum analyzer (67) to generate a power spectrum values of the phase noise (col. 4, lines 53-57).

However, Scott et al. teaches in Fig. 1, a fast Fourier transform (FFT) processor for determining a phase noise spectrum.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Scott et al. to view spectral amplitudes and phases of the frequency components to determine the frequency range of the phase noise.

(2) With regard to claim 3, Scott et al. also discloses in Fig. 2, wherein the phase noise spectrum is scaled to dBc/KHz.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Scott et al. to determine the magnitude/level of the phase noise at a particular frequency.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2) as applied to claim 1, and further in view of Soma et a1. US Patent 6,795,496 B1).

As noted above, the combination of Chen et al. and Yamaguchi et al. disclose all limitations of claim 1 above. They do not however disclose the system comprising more than one ADC and wherein the captured data comprises in-phase (I) and quadrature (Q) components.

However, Soma et al. discloses a method of obtaining a phase noise waveform (abstract) wherein he teaches in Fig. 40a, a system comprising more than one ADC and wherein the captured data comprises in-phase (I) and quadrature (Q) components.

It would have been obvious to one skilled in the art at the time of invention to incorporate more than one ADC to accommodate signals with quadrature modulation.

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2) as applied to claim 9, and further in view of Scott et al. (Ultralow Phase noise Ti:Sapphire Laser Rivals 100 MHZ Crystal Oscillator.

(1) With regard to claim 10, as noted above, the combination of Chen et al. and Yamaguchi et al. disclose all limitations of claim 9. They do not however disclose the method of claim 9, further comprising determining a phase noise spectrum from the residual phase with a fast Fourier transform (FFT) processor, though Chen et al. does teach a spectrum analyzer (67) to generate a power spectrum values of the phase noise (col. 4, lines 53-57).

However, Scott et al. teaches in Fig. 1, a fast Fourier transform (FFT) processor for

determining a phase noise spectrum.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Scott et al. to view spectral amplitudes and phases of the frequency components to determine the frequency range of the phase noise.

(2) With regard to claim 11, Scott et al. also discloses in Fig. 2, scaling the phase noise spectrum to dBc/KHz.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Scott et al. to determine the magnitude/level of the phase noise at a particular frequency.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2) as applied to claim 9, and further in view of Soma et al. US Patent 6,795,496 B1).

As noted above, the combination of Chen et al. and Yamaguchi et al. disclose all limitations of claim 1 above. They do not however disclose the method comprising more than one ADC and wherein the captured data comprises in-phase (I) and quadrature (Q) components.

However, Soma et al. discloses a method of obtaining a phase noise waveform (abstract) wherein he teaches in Fig. 40a, a system comprising more than one ADC and wherein the captured data comprises in-phase (I) and quadrature (Q) components.

It would have been obvious to one skilled in the art at the time of invention to incorporate more than one ADC to accommodate signals with quadrature modulation.

8. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2) as applied to claim 9, and further in view of Scott et al. (Ultralow Phase noise Ti:Sapphire Laser Rivals 100 MHZ Crystal Oscillator.

(1) With regard to claim 18, as noted above, the combination of Chen et al. and Yamaguchi et al. disclose all limitations of claim 17. They do not however disclose the system of claim 17, further comprising means for determining a phase noise spectrum from the residual phase with a fast Fourier transform (FFT) processor, though Chen et al. does teach a spectrum analyzer (67) to generate a power spectrum values of the phase noise (col. 4, lines 53-57).

However, Scott et al. teaches in Fig. 1, a fast Fourier transform (FFT) processor for determining a phase noise spectrum.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Scott et al. to view spectral amplitudes and phases of the frequency components of the phase noise to determine the frequency range of the phase noise.

(2) With regard to claim 19, Scott et al. also discloses in Fig. 2, scaling the phase noise spectrum to dBc/KHz.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Scott et al. to determine the magnitude/level of the phase noise at a particular frequency.

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US Patent 6,246,717 B1) in view of Yamaguchi et al. (US Patent 6,922,439 B2) as applied to claim 17, and further in view of Soma et al. US Patent 6,795,496 B1).

As noted above, the combination of Chen et al. and Yamaguchi et al. disclose all limitations of claim 1 above. They do not however disclose the system comprising more than one ADC and wherein the captured data comprises in-phase (I) and quadrature (Q) components.

However, Soma et al. discloses a method of obtaining a phase noise waveform (abstract) wherein he teaches in Fig. 40a, a system comprising more than one ADC and wherein the captured data comprises in-phase (I) and quadrature (Q) components.

It would have been obvious to one skilled in the art at the time of invention to incorporate more than one ADC to accommodate signals with quadrature modulation.

Allowable Subject Matter

10. Claims 5, 7, 13, 15, 21, 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a system and method for measuring phase noise. A search of prior art records has failed to teach or suggest a system or method of measuring phase noise:

"wherein the signal is from a low noise block (LNB) and the residual phase is substantially a performance measurement of the LNB" as disclosed in claims 5, 13, 21.

"wherein the captured data comprises length based upon a lowest frequency of interest" as disclosed in claims 7, 15, and 23.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) McDonald et al. discloses Signal Processing Method For Improving The Signal-To-Noise Ratio Of A Noise-Dominated Channel And A Matched-Phase Noise Filter For Implementing The Same.

b.) Niho discloses in US Patent 5,043,743 Discrete AutoFocus For Ultra-High Resolution Synthetic Aperature Radar.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghayour Mohammad can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams
lbw
May 25, 2007

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER